

What is claimed is:

1. An applicator for applying functional substances into human skin, comprising:
 - (a) a base,
 - (b) a plurality of microneedles fixed to said base and projecting therefrom a distance sufficient to penetrate into the skin, said microneedles being made of a material that is capable of disintegration and dispersion into the skin, and
 - (c) a functional substance carried by said microneedles for delivery by said microneedles into the skin.
2. An applicator according to claim 1 and characterized further in that said functional substance is distributed in the material of said microneedles.
3. An applicator according to claim 2 and characterized further in that said functional substance is distributed homogeneously throughout said microneedles.
4. An applicator according to claim 1 and characterized further in that said functional substance is encapsulated in said microneedles.
5. An applicator according to claim 1 and characterized further in that said base and said microneedles are integrally molded from the same material.
6. An applicator according to claim 5 and characterized further in that said functional substance is distributed homogeneously throughout said base and microneedles.
7. An applicator according to claim 1 and characterized further in that said microneedles are generally cone shaped.
8. An applicator according to claim 1 and characterized further in that said microneedles are square in cross-section.
9. An applicator according to claim 1 and characterized further in that said microneedles are polygonal in cross-section.

10. An applicator according to claim 1 and characterized further in that said microneedles are at least partially elliptical in cross-section.

11. An applicator according to claim 1 and characterized further in that the material of said needles is substantially sugars that dissolve within the human body.

12. An applicator according to claim 1 and characterized further in that said microneedles are constricted intermediate their ends to facilitate breaking off the portions of the needles beyond the narrow portions to leave those portions in the skin.

13. An applicator according to claim 1 and characterized further in that said microneedles have relatively thin outer portions and relatively thick inner portions adjacent said base with a step between said portions to facilitate separation of said outer portions from said inner portions with the outer portions remaining in the skin.

14. An applicator according to claim 1 and characterized further in that said microneedles have tips that are knife-shaped to facilitate insertion into the skin.

15. An applicator according to claim 1 and characterized further by microcontainers containing said functional substance, said microcontainers being contained within said microneedles for delivery into the skin.

16. An applicator according to claim 15 and characterized further in that said microneedles are formed with barbed tips and said microcontainers are disposed in said barbed tips for separation with the barbed tips from the remainder of the microneedles for retention in the skin upon removal of the base.

17. An applicator according to claim 1 and characterized further in that said microneedles have capillary recesses in outer portions thereof for retaining said functional substances for delivery into the skin.

18. An applicator according to claim 17 and characterized further in that said capillary recesses extend along a central axis of said microneedles and are open at the outer ends of said microneedles.

19. An applicator according to claim 1 and characterized further in that said microneedles project from said base a distance sufficient to penetrate the stratum corneum.

20. An applicator according to claim 19 and characterized further in that said microneedles project approximately 0.5 to 500 μm from said base.

21. An applicator according to claim 20 and characterized further in that said microneedles are generally cone shaped with the diameter at said base being approximately 0.1 to 100 μm .

22. An applicator according to claim 20 and characterized further in that said microneedles are square in cross-section with the sides being approximately 0.1 to 100 μm at said base.

23. An applicator according to claim 20 and characterized further in that said microneedles are polygonal in cross-section with the sides being approximately 0.1 to 100 μm at said base.

24. An applicator according to claim 20 and characterized further in that said microneedles are at least partially elliptical in cross-section with a shortest diameter of 0.1 to 100 μm at said base.

25. An applicator according to claim 1 and characterized further in that said microneedles project from said base a distance sufficient to penetrate the dermis.

26. An applicator according to claim 25 and characterized further in that said microneedles project approximately 500 to 5,000 μm from said base.

27. An applicator according to claim 26 and characterized further in that said microneedles are generally cone shaped with the diameter at said base being approximately 0.1 to 1,000 μ m.

28. An applicator according to claim 26 and characterized further in that said microneedles are square in cross-section with the sides being approximately 0.1 to 1,000 μ m at said base.

29. An applicator according to claim 26 and characterized further in that said microneedles are polygonal in cross-section with the sides being approximately 0.1 to 1,000 μ m.

30. An applicator according to claim 25 and characterized further in that said microneedles are at least partially elliptical in cross-section with a shortest diameter of 0.1 to 1,000 μ m at said base.